

## MASS FLOWMETER SERIES

# The World Market for Mass Flow Controllers, 4<sup>th</sup> Edition

## — OVERVIEW —



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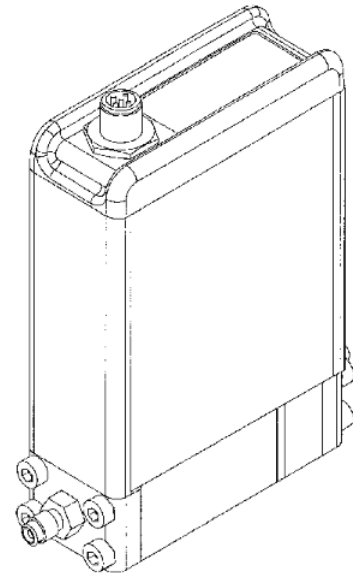
# The World Market for Mass Flow Controllers, 4<sup>th</sup> Edition

Flow Research is pleased to announce a new market study, *The World Market for Mass Flow Controllers, 4<sup>th</sup> Edition*, as part of a *Mass Flowmeter Series* that also includes *The World Market for Mass Flow Measurement*, *The World Market for Coriolis Flowmeters, 7<sup>th</sup> Edition*, and *The World Market for Thermal Flowmeters, 3<sup>rd</sup> Edition*.

The main goal of the study is to determine the size of the mass flow controller (MFC) market in 2023 and to forecast market growth through 2028. In this study, we consider devices shipped without a control valve that measure flowrate only to be mass flow controllers. Segmentation will include total worldwide market size broken down by eight geographic regions and the basic MFC technology types: thermal, pressure, Coriolis, and ultrasonic. Because MFCs are used both to measure and to control fluid flows, the study will identify their use by fluid type. We will also quantify the presence of MFCs in significant industries and applications.

The study achieved multiple objectives to:

- Determine worldwide market size and shares for the mass flow controller market in 2023 for both thermal and non-thermal (pressure, Coriolis, and ultrasonic) types
- Forecast market growth for all types of mass flow controllers through 2028
- Segment data both on a worldwide basis and for each of eight global regions
- Determine the average selling price of mass flow controllers by type worldwide and by region
- Identify the industries, applications, and sectors where mass flow controllers are used and growing
- Analyze products for the main companies selling into the mass flow controller market
- Profile the main suppliers of mass flow controllers
- Discuss market forces and suggest strategies for selling into the mass flow controller market



## Rationale for Study

A number of suppliers had asked us to find out how the market has changed since our last MFC study was published in 2018. We believe several factors are affecting the MFC market: environmental applications such as fuel cells and solar/photovoltaic, the push for automation in factories, and growth in the emerging markets of China, India, Australia, Indonesia, and Malaysia.

In addition, the semiconductor is continuing to grow rapidly as remote working, AI, and electric vehicles become commonplace. We believe the semiconductor industry will remain the dominant industry for mass flow controllers. (Despite recent supply shortages and its notoriously cyclical nature, [McKinsey](#) projects the global semiconductor industry will become a trillion-dollar industry

by 2030.) *The World Market for Mass Flow Controllers, 4<sup>th</sup> Edition* sizes the MFC semiconductor market and provide market shares for suppliers to this large market. In addition, the study also researches industrial segments that provide applications for mass flow controllers outside the semiconductor market. Some of these segments are faster growing than semiconductors and hold the promise of long-term applications for MFCs. In addition, they are not cyclical, so they can provide some predictability for companies that want more stable sales growth.

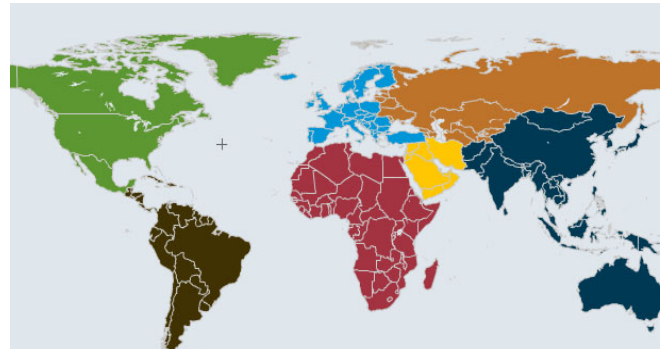
The segmentation in this study includes corrosive and non-corrosive gases (including air), and petroleum and non-petroleum liquids, along with shipments by industrial segments. We distinguish between MFCs that are flowmeters shipped with controllers and MFCs that measure flow but do not control it. We also include breakouts of MFCs by flowrates, by wetted material type, and by communication protocols. Data for the most significant segmentation includes revenues and units shipped.

We believe this comprehensive study is timely given the growth in the semiconductor and industrial markets. We are also excited to present the MFC market in the context of the larger mass flow market that includes Coriolis and thermal flowmeters.

## Study Segmentation

### Geographic Regions

- North America
- Western Europe
- Eastern Europe/FSU
- Middle East/Africa
- China
- Japan
- Asia/Pacific (without Japan and China)
- Latin America



### Shipments of Mass Flow Controllers by Technology Worldwide and by Region

- Thermal
- Differential Pressure (DP)
- Coriolis
- Ultrasonic

### Shipments of Mass Flow Controllers by Industry Type Worldwide and by Region

- Semiconductor (including all processes involved in the design and fabrication of semiconductor devices and related equipment)
- Industrial (including all other industrial process control processes as well as research & development)

### Shipments of Mass Flow Controllers by Industrial Segment

- Aerospace
- Alternative Energy  
(includes Fuel Cell, Hydrogen)
- Analytical / Gas Analyzers
- Automotive
- Biotech / Pharmaceutical
- Chemical / Petrochemical  
(includes CO<sub>2</sub>)
- Electronics Manufacturing
- Fiber Optics / Glass
- Food / Beverage
- Furnaces
- Gas Distribution
- Heat Treating
- Lab Grown Diamonds
- LED Lighting
- Medical
- Metals Processing (includes coating)
- Packaging
- Photovoltaic / Solar/Solar Cells
- Power
- Thin Film Coating
- University / Government / Research Lab
- Other

### Shipments of Mass Flow Controllers by Control Function Worldwide and by Region

- With Control Valve
- No Control Valve – flowmeter only

### Shipments of Mass Flow Controllers by Flowrate

- <10 sccm
- 10 – 1000 sccm
- 1 – 10 slpm
- >10 – 30 slpm
- >30 – 50 slpm
- >50 – 100 slpm
- >100 – 200 slpm
- >200 – 500 slpm
- >500 – 1000 slpm
- >1000 slpm

(*sccm* = Standard Cubic Centimeters per Minute); (*slpm* = Standard Liters per Minute)

### Average Selling Price of Mass Flow Controllers Worldwide and by Region

- The average selling price of mass flow controllers worldwide and by region
- The average selling price of mass flow controllers by industry type

### Shipments of Mass Flow Controllers by Fluid Type

- Corrosive Gases
- Non-corrosive Gases (Including Air)
- Hydrocarbon/Petroleum Liquids
- Non-hydrocarbon/Non-petroleum Liquids

### Shipments of Mass Flow Controllers by Approvals

- General Purpose/Indoor Use
- Outdoor Use/Hosedown Washdown
- Non-hazardous
- Hazardous Area

### Shipments of Mass Flow Controllers by Wetted Material Type

- Stainless Steel (all grades)
- PTFE (Teflon)
- Aluminum
- Plastic
- Other

### Shipments of Mass Flow Controllers by Communication Type

- Analog: 0-10 Vdc
- Analog: 4-20 mA
- Digital: including HART, Foundation Fieldbus, Profibus, Modbus, RS485, DeviceNet
- Ethernet IP, PROFINET, Modbus TCP/IP
- IO-Link
- EtherCAT
- CANopen

### Shipments of Mass Flow Controllers by Temperature Range

- <60 or 70 Deg C (normal)
- >70 – 100 Deg C (high temp)
- >100 – 200 Deg C (very high temp)
- >200 Deg C (incredibly high temp)

### Shipments of Mass Flow Controllers by Seal Type

- Metal Sealed
- Elastomer Sealed

### Shipments of Mass Flow Controllers by Distribution Channel Worldwide and by Region

- Direct Sales
- Independent Representatives
- Distributors
- Resellers (e.g., private label, catalog)
- E-Business

### Shipments of Mass Flow Controllers by Customer Type Worldwide and by Region

- End-User
- Original Equipment Manufacturers (OEMs)
- Systems Integrators
- Engineering Companies

#### We provide profiles of major MFC suppliers, including:

- Alicat Scientific
- Azbil
- Beijing Sevenstar Flow Co.
- Bronkhorst / M+W Instruments
- Brooks Inst. (owned by ITW)
- Bürkert
- Fujikin Incorporated
- Horiba
- Kuwana Metals (formerly Hitachi Metals)
- LINTEC
- MK Precision
- MKS Instruments
- Pivotal Systems
- Sensirion
- TASI: Sierra Instruments, Vögtlin
- Teledyne Hastings
- Tokyo Keiso

**Publication Date:** Fourth quarter of 2024.

## Flow Research, Inc.

Flow Research is the only market research company that publishes studies on all nine flowmeter types and whose primary mission is to research process control instrumentation markets. In addition to studies on both new and conventional flowmeter types, we have researched pressure transmitters; temperature sensors and transmitters, infrared thermometers and thermal imagers; level devices; analytical instrumentation; and selected API-certified valves. We also publish studies on oil & gas and other major flowmeter markets. In addition, Flow Research started a working group on flowmeter calibration (FRWG.org) and published two studies on flowmeter calibration facilities, one each for liquids and gas.



**Dr. Jesse Yoder, president and founder  
of Flow Research**

## Partnerships and Alliances

Flow Research helps flowmeter companies form alliances and partnerships to provide specific solutions or broaden their customer base and distribution channels. These partnerships can include manufacturers of valves, hoses, transmitters, or other flow-related products, as well as other flowmeter manufacturers.

## Distributorships

Are you thinking about expanding your presence in the U.S.? We can help you find distributors for your flowmeters and other instrumentation.

## Custom Projects

Companies commission us for custom projects when they want more detailed information on a specific subject than is possible in an off-the-shelf report. They may be evaluating the future or expansion of a product line, determining whether to acquire or merge with another company, or seeking to better understand their customer needs.

## Consulting

We also work with companies individually to formulate strategies that help them succeed in an increasingly complex world. Dr. Yoder and his team have studied hundreds of companies and have advised most of the top flowmeter suppliers on market and product strategies.

### **Flow Research Gold Partner Program: *Your input, please***

Make sure this study meets your needs by telling us what you think about our scope and segmentation. By becoming a Gold Partner, you can also enjoy a significant discount on the regular price of the study. Being a Gold Partner requires making an early commitment to purchase the study, but you can make payments either in one amount at the beginning of the study or split into two, with the second payment due upon delivery of the study. For more details, please contact Jesse Yoder at +1 781 245-3200, or [jesse@flowresearch.com](mailto:jesse@flowresearch.com).

*We look forward to working with you.*

## Research Team Background

**Dr. Jesse Yoder**, the lead analyst for this study, is President of Flow Research Inc., which he founded in 1998. He has worked as a writer and analyst in process control and instrumentation since 1987 and has created market research studies since 1990. Since then he has written over 300 market research studies, most of them on flow and instrumentation, and over 300 articles on flow and instrumentation for trade journals. (See [www.flowarticles.com](http://www.flowarticles.com).)

Dr. Yoder received a PhD in philosophy from the University of Massachusetts Amherst in 1984 and spent 10 years as an adjunct philosophy professor at the University of Massachusetts Lowell and Lafayette College. Dr. Yoder also worked 10 years as a technical writer, including for the process control division of Siemens, and taught technical writing at Northeastern University and the UMass Lowell.

Dr. Yoder has received two U.S. patents for the flowtube meter, a new dual tube/dual sensor method of measuring flow, in 2015 and 2017. This meter's two prototypes have been tested at CEESI in Nunn, Colorado.

In 2015, ISA published Dr. Yoder's book, *The Tao of Measurement*, with Richard E. Morley as co-contributor. Topics included temperature, pressure, flow, time, length, and area. CRC Press published Dr. Yoder's two-book set, *Advances in Flowmeter Technology*, on the history, operating principles, growth factors, representative companies, and frontiers of research for all 10 types of flowmeters. The first volume, *New-Technology Flowmeters*, published September 6, 2022, was followed by *Conventional Flowmeters* on December 15, 2022.



*Belinda Burum*

**Belinda Burum**, Vice President, joined Flow Research in 2002. Since then, she has served as senior strategic advisor and been involved with most of our projects and publications. She has also worked as a writer and editor in journalism, advertising, and high tech marketing communications and customer references for 40+ years in the U.S. and Switzerland and is a published author and book editor. She has travelled extensively and enjoyed teaching English in Massachusetts, California, and Ecuador.

**Leslie Buchanan**, Research and Publication Production Associate, joined Flow Research in 2010 with a variety of skills from education, work and life experiences here and abroad. She is involved in many capacities with our studies, projects, and other publications.

**Vicki Tuck**, Administrative Assistant, joined Flow Research in 2012 with experience in both the fast-paced law firms of Boston and in various nonprofit organizations. She handles many office functions – essential to keep any business running – including the contacts database.

**Dan Sparks**, Research Director, joined Flow Research in 2023. His experience includes serving as director of product management and director of business development for Omega Engineering, and, before that, marketing director at Watlow; VP & GM at MTS Systems; and engineering director at Thermo Nicolet – plus a PhD in chemistry.



*Dan Sparks*

## Recent and Currently Scheduled Flow Research Studies

### New-Technology Flowmeter Studies

Mass Flowmeter Series	<a href="http://www.massflows.com">www.massflows.com</a>
The World Market for Mass Flow Measurement (Core Study)	
The World Market for Coriolis Flowmeters, 7 <sup>th</sup> Edition	<a href="http://www.flowcoriolis.com">www.flowcoriolis.com</a>
The World Market for Thermal Flowmeters, 3 <sup>rd</sup> Edition	<a href="http://www.flowthermal.com">www.flowthermal.com</a>
The World Market for Mass Flow Controllers, 4 <sup>th</sup> Edition	<a href="http://www.flowmfc.com">www.flowmfc.com</a>
The World Market for Magnetic Flowmeters, 8 <sup>th</sup> Edition	<a href="http://www.flowmags.com">www.flowmags.com</a>
The World Market for Ultrasonic Flowmeters, 7 <sup>th</sup> Edition	<a href="http://www.flowultrasonic.com">www.flowultrasonic.com</a>
The World Market for Vortex Flowmeters, 7 <sup>th</sup> Edition	<a href="http://www.flowvortex.com">www.flowvortex.com</a>
The World Market Update for Mass Flow Controllers	<a href="http://www.flowmfc.com">www.flowmfc.com</a>
The World Market for Multiphase Flowmeters, 2 <sup>nd</sup> Edition	<a href="http://www.flowmultiphase.com">www.flowmultiphase.com</a>
Multiphase: Module A: The World Market for Watercut Meters	<a href="http://www.watercutmeters.com">www.watercutmeters.com</a>

### Conventional Flowmeter Studies

The World Market for Pressure Transmitters, 5 <sup>th</sup> Edition	<a href="http://www.worldpressure.com">www.worldpressure.com</a>
The World Market for Primary Elements, 3 <sup>rd</sup> Edition	<a href="http://www.flowplate.com">www.flowplate.com</a>
The World Market for Positive Displacement Flowmeters, 3 <sup>rd</sup> Edition	<a href="http://www.flowpd.com">www.flowpd.com</a>
The World Market for Turbine Flowmeters, 3 <sup>rd</sup> Edition	<a href="http://www.flowturbine.com">www.flowturbine.com</a>
The World Market for Variable Area Flowmeters	<a href="http://www.flowva.com">www.flowva.com</a>

### Cross-Technology Flowmeter Studies

Volume X: The World Market for Flowmeters, 9 <sup>th</sup> Edition	<a href="http://www.flowvolumex.com">www.flowvolumex.com</a>
Volume X: Module A: Strategies, Industries, and Applications	<a href="http://www.flowvolumex.com">www.flowvolumex.com</a>
The World Market for Gas Flow Measurement, 4 <sup>th</sup> Edition	<a href="http://www.gasflows.com">www.gasflows.com</a>
Gas Module A: Applications and Strategies for Gas Flow Measurement	<a href="http://www.gasflows.com">www.gasflows.com</a>
Gas Module B: Natural Gas Production, Consumption, and Flow Measurement in the Oil & Gas Industry	<a href="http://www.gasflows.com">www.gasflows.com</a>
Flowmeters in the Oil & Gas Industry	<a href="http://www.oilflows.com">www.oilflows.com</a>

### Flow Calibration Studies

Core Study: Worldwide Gas Flow Calibration Facilities and Markets	<a href="http://www.flowcalibration.org">www.flowcalibration.org</a>
Module A: Worldwide Liquid Flow Calibration Facilities and Markets	<a href="http://www.flowcalibration.org">www.flowcalibration.org</a>

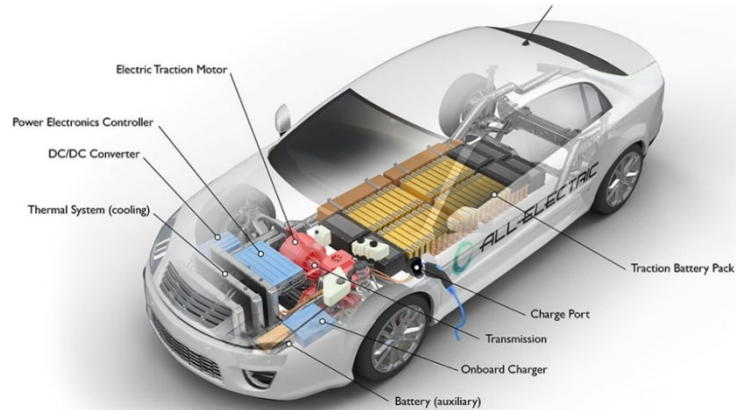
### Temperature

Market for Temperature Sensors in the Americas, 3 <sup>rd</sup> Edition	<a href="http://www.tempresearch.com">www.tempresearch.com</a>
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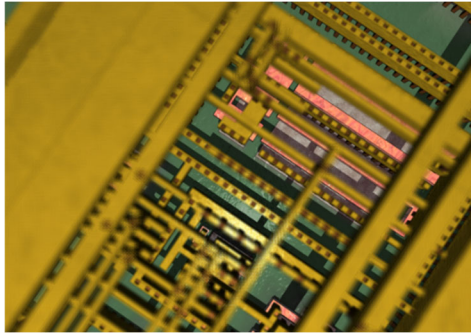
*We further describe these studies at [www.FlowStudies.com](http://www.FlowStudies.com).*



For more information on Flow Research, please visit our website at [www.flowresearch.com](http://www.flowresearch.com). Please follow us on Facebook, LinkedIn, Twitter, and Instagram. We also invite you to join our Flow Research LinkedIn group.



*A typical design for an all-electric fuel cell powered automobile*



*An image of a silicon chip  
(Author: David Carron)*

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### **Why Flow Research? Because we . . .**

- Are the only company whose sole focus is the flowmeter instrumentation market
- Research all new-technology and conventional flowmeters
- Contact every known supplier
- Offer our studies in both electronic and color-printed hardcopy versions
- Draw on flowmeter data dating back to 1992, when we began actively following the market

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